Investigation of High Temperature Creep of Iron by the Torsion Method

by good agreement between the results obtained on heating and cooling. The results of the first series of experiments are reproduced in Fig 3, where the rate of the secondary creep (u, °/sec) of iron (type 1) is plotted against temperature (°C). It will be seen that in the α-Fe range, u increased exponentially with rising temperature, reaching a maximum at approximately 910 °C; at higher temperatures u gradually decreased, reaching a minimum at approximately 1050 °C. The general character of this relationship remained the same when larger torques were applied, although in these cases the minimum value of u was reached at different temperatures. The absence of a sharp drop in the rate of creep at the temperature of the $\alpha \rightarrow \gamma$ transformation was attributed to strain-hardening, associated with the volume changes accompanying the change of the crystal lattice from body-centred to face-centred. The temperature dependence of the rate of creep of γ-Fe at temperatures above 1040 °C (which has been found to follow the law described by Eq (1), is illustrated

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graphically in Fig 4 in the form of log u versus $1/T \times 10^4$ curves, plotted for specimens listed in Table 2 under the following headings: number of the specimen; torque (M, kg-cm); type of iron; activation energy for creep (Q, kcal/g-atom); diameter of the specimen (d, mm); τ_s - maximum tangential stress, calculated from Eq (2) (kg/cm^2). Metallographic examination of specimens that had been subjected to deformation at 1100 °C showed the presence of cracks and pores (Fig 5); the density of these defects was particularly high in the surface layer of the specimen near the fracture region (Fig 5b). The formation of these defects was attributed by the authors to the generation and movement of excess vacancies; owing to the complex distribution of stress in the cross-section of the specimen strained in torsion, the density of the excess vacancies was not uniform, increasing with increasing distance from the axis of the specimen. Since it can be postulated that creep is determined by the processes of self-diffusion and formation of excess

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vacancies, the activation energy for creep should be equal to the sum of activation energies for these two processes, and such in fact was found to be the case. Thus, the results obtained by the authors show that the activation energy, Q, for creep of γ-Fe (within the investigated temperature and applied stress range) does not depend on the temperature and is equal 95.2 kcal/g-atom. The absolute value of Q is the same as that of the heat of evaporation of iron; in its physical sense, however, Q is most probably determined by the processes of self-diffusion and formation of excess vacancies, this view being supported by the presence of cracks and pores, formed in the course of deformation. Since it has been shown (Ref 17) that in the case of many metals, the activation energy of fracture under low applied stresses is also equal to the sum of the activation energies for self-diffusion and formation of excess vacancies, the present authors concluded that the phenomena taking place in a specimen stressed in torsion are similar to those that occur during rupture due to small tensile stresses.

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67830
SOV/180-59-6-6/31

Investigation of High Temperature Creep of Iron by the Torsion Method

There are 5 figures, 2 tables and 17 references, of which 10 are Soviet and 7 English.

SUBMITTED: May 29, 1959

Card 7/7

S/180/60/000/005/006/033
E073/E535

18.8200 1146,1454,1467
10.9200

AUTHORS: Ivanov, L. I., Matveyeva, M.P. and Prokoshkin, D.A. (Moscow)

TITLE: Investigation of Plastic Deformation of High Melting Alloys at Elevated Temperatures

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskiy nauk, Metallurgiya i toplivo, 1960, No.5, pp.79-85

TEXT: The results are described of investigations of creep in torsion at various stresses and temperatures in titanium, niobium and chromium. The technique of investigation was similar to that applied in earlier work (Ref.7). All the tests were carried out in vacuum with a residual pressure of 10^{-5} mm Hg, both for constant temperature and also for cyclically varying temperatures. In the latter case the specimen was tested with a constant torque at various temperatures. Straight line dependence on the diagram strain versus time was taken as evidence that the steady state of creep had been reached at the given temperature. The reliability of the obtained results was verified by the coincidence of the activation energy of the steady state creep during gradual increase and decrease in the temperature. In the case of titanium, metal of 99.5% purity was chosen that had been forged into rods of

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S/180/60/000/005/006/033
E073/E535

Investigation of Plastic Deformation of High Melting Alloys at Elevated Temperatures

12 mm diameter and also iodide titanium that had been purified by zonal melting. The specimens had a gauge length of 12 mm and a diameter of 3 mm. Their surface was carefully polished. The creep was tested in the range of β modification (1000 to 1500°C) with torques of 90.5, 109, 137 and 200 g/cm. Fig.1 shows the graphs of the logarithm of creep speed as a function of the reciprocal of the temperature for various torques. It was found that the results complied with the following relation (1)

$$U = K \exp\left(-\frac{Q(\sigma)}{RT}\right)$$

where U - creep speed, Q - energy creep parameter depending on the applied stress and temperature, K - a constant which is sensitive to the structure of the metal (or the alloy). The activation energies did not vary greatly, the average being 32.3 kcal/g.atom. The creep of chromium was determined (on specimens with 14 mm gauge length and 3 mm diameter) in the temperature range 900 to 1380°C, using electrolytic chromium after resmelting in the suspended state

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S/180/60/000/005/006/033
E073/E535

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in an atmosphere of dried and purified helium. The dependence of the logarithm of the speed of creep of Cr on the reciprocal of the temperature for various stresses is graphed in Fig.3. Similar results for niobium specimens are plotted in Fig.5. The dependence of the activation energy of chromium and niobium on the applied stresses is plotted in Figs. 4 and 6. The following conclusions are arrived at: no temperature dependence of the activation energy of steady state creep was observed for chromium, niobium and titanium. With increasing applied stress, the creep activation energy of Cr and Nb decreases, whilst that of Ti remains unchanged. The absolute value of the creep activation energy of titanium is less than that of self-diffusion. The creep activation energy of Cr and Nb at $\tau = 0$ is a complex value equalling in the first approximation the sum of the activation energy of self-diffusion and the energy of formation of vacancies. Microscopic analysis using special methods of etching has shown clearly the validity of the dislocation mechanism of plastic deformation of chromium at

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elevated temperatures up to 400°C. The process of polygonization has been investigated and it is shown that development of polygonization can be observed even at the beginning of the second stage of creep. There are 6 figures and 17 references: 9 Soviet, 1 German and 7 English.

SUBMITTED: May 27, 1960

Card 4/4

S/180/60/000/005/021/033
E111/E135

AUTHORS: Dekhtyar, I.Ya., Ivanov, L.I., Matveyeva, M.P. and Prokoshkin, D.A. (Moscow)

TITLE: Influence of Plastic Deformation on the Kinetics of Evaporation of Iron from Type 10 Steel

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, No.5, pp.171-173

TEXT: The authors point out that crystal lattice defects produced by plastic deformation must affect both partial and integral thermodynamic properties. Dekhtyar et al. (Ref.1) and other authors (Refs 2, 3) have previously shown that plastic deformation affects many properties. The present work gives preliminary results of an investigation of the influence of plastic deformation (torsion) on the rate of evaporation of iron from type 10 steel (0.10% C; 0.45 Si; 0.03 P; 0.02 S; 0.26 Al; remainder Fe). The apparatus developed and used is shown in Fig.1: the hollow cylindrical specimen has its open end closed with a tantalum diaphragm to form a Knudsen cell. The specimen, subjected to torsion if required, is heated in a

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S/180/60/000/005/021/033
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Influence of Plastic Deformation on the Kinetics of Evaporation of Iron from Type 10 Steel

graphite inductor of an axially varying wall thickness. After fabrication specimens were annealed in helium for 30 minutes at 1200 °C, sealed in quartz capsules and irradiated with thermal neutrons, giving Fe^{59}. The rate of evaporation was found from the activity of the deposit on a molybdenum foil (polished to a mirror finish) in an aluminium holder cooled with liquid nitrogen. Fig.2 shows evaporation rates of iron for undeformed specimens of the steel (curve 1) and pure iron (curve 2). Fig.3 shows evaporation rate for the steel (curve 1) and the corresponding deformation rate (curve 2). The effect is complex and the authors suggest a similar study on pure iron.
There are 3 figures, 1 table and 4 references: 2 Soviet and 2 English.

SUBMITTED: March 22, 1960

Card 2/2

DEKHTYAR, I.Ya.(Moskva); IVANOV, L.I.(Moskva); MATVEYEVA, M.P.(Moskva); PROKOSHKIN, D.A.(Moskva)

Effect of plastic deformation on the kinetics of iron volatilization from 10-percent carbon steel. Izv. AN SSSR. Otd. tekh. nauk. Met.i topl. no.5:171-173 S-O '60. (MIRA 13:11)
(Dislocations in metals) (Radioisotopes--Industrial applications)

36825
S/137/62/000/004/135/201
A060/A101

18.8200

AUTHORS: Ivanov, L. I., Bystrov, L. N.

TITLE: Investigation of metal creep by the torsion method in the region of polymorphic transformations

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 4, 1962, 90-91, abstract 4I545 (V sb. "Fiz.-khim. osnovy proiz-va stali", Moscow, AN SSSR, 1961, 331-336)

TEXT: The description is given of an installation which makes it possible to apply the method of investigating creep in torsion for the study of phase transformations in metals and alloys. The specimen in the form of a cylinder 2 - 3 mm diameter and working part 14 mm long is fixed in Mo clamps. One of the clamps rotates freely and bears a lever upon which a weight is hung, producing the M_{tor}; the other clamp is coupled to an electric motor through a reducer. The specimen is deformed under the action of M_{tor}-const and the magnitude of the specimen deformation is limited only by its destruction. The time dependence of the deformation is automatically recorded by an ЭПП-09 (EPP-09) type instrument. The tests are carried out under vacuum of about 10^{-5} mm Hg. The

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Investigation of metal creep ...

heating of the specimen is carried out by means of a tubular graphite heater (the specimen is located coaxially to the heater); the temperature control is realized by a Pt/Pt-Rh thermocouple connected to a potentiometer ЭПД -17 (EPD-17). The testing apparatus is situated in a vacuum under a water-cooled Cu hood. A kinematic diagram and a photograph of the installation are presented. The creep rate of Fe in the temperature range from 850 - 1,400°C was determined by means of the described installation. In determining the temperature dependence of the creep rate the cyclic method of testing was used; in the temperature region in the neighborhood of the polymorphic $\alpha - \gamma$ transformation the variation in the creep rate has an anomalous character. The installation described makes it possible to carry out investigations of the temperature dependence of the creep rate, and the data obtained may be utilized for the phase analysis of metals and alloys in a wide temperature range (up to 1,600°C).

Z. Fridman

[Abstracter's note: Complete translation]

Card 2/2

S/139/61/000/005/007/014
E073/E335

AUTHORS: Prokoshin, D.A., Ivanov, L.I. and Yanushkevich, V.A.

TITLE: Investigation of the activation energy of steady-state creep of β-titanium

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, no. 5, 1961, pp. 65 - 67

TEXT: The investigations were by the torsion method. The equipment and the method of investigation were described by the authors and their team in Ref. 2 (Izv. AN SSSR, OTN, no. 6, 1959). All the experiments were made in a vacuum of 10^{-5} mm Hg. 3-mm dia. titanium specimens with a gauge length of 12 mm, machined to an accuracy of ± 0.01 mm, were used. All the specimens were polished. Two types of titanium were used: a forged 12-mm dia. titanium rod of a guaranteed purity of 99.5%; iodide titanium which was additionally purified by zonal fusion to a purity of at least 99.9%. The forged titanium contained the following impurities (in %): 0.05 Fe; 0.03 Cl; 0.03 Si; 0.05 C; 0.02 N_2; 0.11 O_2. The tests were made in the

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temperature range 1 000 - 1 500 °C by the method of thermal cycling, whereby each specimen was tested with a constant load at various temperatures. The loads applied in the tests were 12.96, 15.62, 19.6 and 26.35 kg/cm^2. This enables eliminating the influence of individual peculiarities of the specimen, which is particularly important when investigating the activation energy of creep. It was found that the activation energy of steady-state creep of β-titanium did not depend on the test temperature or on the applied stresses. For the applied stresses the creep activation energy of β-titanium was lower than the activation energy of the self-diffusion of β-titanium and corresponded to limit values of Q , which were calculated from the conditions of transition from the solid into the liquid state.
There are 2 figures, 2 tables and 7 references: 5 Soviet-bloc and 2 non-Soviet-bloc. The two English-language references mentioned are: Ref. 3 - O.D. Sherby, I.L. Lytton and I.E. Dorn - Acta Metallurgica, v. 5, no. 4, 1957: Ref, 6 - J.W. Edwards,

S/139/61/000/005/007/014
E073/E335

Investigation of ....

H.L. Johnston and W.E. Ditmarsh, J. Amer. chem. Soc., 75, 2467, 1953.

ASSOCIATION: Institut metallurgii imeni A.A. Baykova
(Institute of Metallurgy imeni A.A. Baykov)

SUBMITTED: August 5, 1960

Card 3/3

30901
S/180/61/000/005/011/018
E193/E383

10.7300 1413

AUTHORS: Surova, E.A. and Ivanov, L.I. (Moscow)

TITLE: Investigation of steady-state creep of iron-aluminium alloys at high temperatures by the torsion method

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo. no. 5, 1961, pp. 78 - 82

TEXT: Of many theories put forward to explain the mechanism of steady-state creep, that based on the theory of dislocations seems to be most satisfactory. In this connection, the present authors refer to the fact (Ref. 9 - Investigation of creep of α-iron by the torsion method. Symposium of scientific papers on the theory of strength at high temperatures. IMET AN SSSR, Moscow, 1961, pp. 85-93) that an increase in the applied stress brings about a decrease in the activation energy for steady-state creep, which falls from 78 kcal/g.atom to values approaching the activation energy for self-diffusion (approximately 50 kcal/g.atom), owing to the concentration of the dislocation barriers in a dislocation segment of length L increasing to a critical value

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Investigation of ....

$n_L = 1$. At the same time it can be postulated that the energy of formation of dislocation barriers and, consequently, their concentration are related to the magnitude of the internal-stress field in the alloy so that an increase in the degree of lattice distortion should cause a decrease in the energy of formation of dislocation barriers, and vice versa. Hence, it can be postulated that when the degree of the solute lattice distortion is increased by the introduction of an alloying element with a different atomic radius, the dislocation-barrier concentration will also decrease to a critical value $n_L = 1$ which, at a low applied stress, will lead to a decrease in the activation energy for steady-state creep. The object of the present investigation was to check this hypothesis by studying steady-state creep of iron-aluminium alloys under low stresses at which the activation energy of steady-state creep of α-iron remains constant and equal to the sum of activation energy for self-diffusion and the energy of formation of dislocation barriers. The experimental alloys contained 0.95 to 29.5 at.% Al.

Card 2/[illegible]

Investigation of ....

Creep tests were carried out at 700 - 1 300 °C in vacuum on specimens 3 mm in diameter, 14 mm gauge length, tested in torsion under stresses of 26.6, 65.5 and 133 kg/cm^2. In interpreting the experimental results, the generally accepted expression for the rate of steady-state creep was used

$$U = U_o e^{-Q/RT}$$

where Q is the activation energy for creep, and
U_o is the pre-exponential factor.

Typical results are reproduced in Fig. 1, where log U is plotted against 1/T for the 29.5 at.% Al alloy, tested under a stress of 133 kg/cm^2. It will be seen that in the presence of applied stress, the transition from the α-solid solution to the ordered state occurs not at a single temperature but within a wide temperature interval (920 - 990 °C). It was found also that in the 26.6 - 133 kg/cm^2 stress range, the activation energy for steady-state creep of Fe-Al alloys was stress-independent.

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Investigation of ....

This is shown in Fig. 2, where Q(kcal/g.atom) is plotted against the Al content (at.%), Curves 1 (dots) and (crosses) relating, respectively, to the activation energy for creep of Fe-Al alloys and the activation energy for self-diffusion of Fe in these alloys. The results reproduced in Fig. 2 were obtained at 970 - 1 150 °C, i.e. at temperatures at which all of the alloys studied were in the α-solid solution range and under stresses of 65.5 and 133 kg/cm^2. In Fig. 3, log U_o is plotted against log τ (where τ is the applied stress), Curves 1-7 relating, respectively, to α-Fe and Fe-Al alloys with 0.95, 22.2, 19.45, 26.6, 29.5 and 13.3 at.% Al. It will be seen that in every case the relationship between U and τ can be described by $U = a\tau^n$, the value of n for each alloy being shown by a corresponding curve. Finally, in Fig. 4, log U is plotted against the Al content (at.%), the test temperature being indicated by each curve, the continuous, broken and dotted curves relating to tests carried out under a stress of 133, 26.6 and 65.5 kg/cm^2, respectively. In discussing their findings,

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the present authors point out that the increase in the bond energy of the alloy caused by addition of Al (Fig. 2) and the broadening of the temperature range separating the α-range from the superstructure (FeAl) range (Fig. 1) indicate that the disorder-order transformation has a fluctuating character and that blocks of ordered structure of the FeAl type exist in the α-solid-solution range. Consequently, whereas in the case of pure α-Fe, the movement of dislocations situated in parallel slip planes is retarded owing to the interaction between leading dislocations, movement of dislocations in Fe-Al alloys is probably retarded by the blocks having a superlattice structure of the FeAl type. The height to which a dislocation has to climb to surmount the elastically distorted region, resultant from the action of a block with an ordered structure, will depend on the size of this region. Consequently, the rate of creep should decrease as the size and strength of the fluctuating blocks of ordered structure increase. In other words, as a result of thermodynamical heterogeneity of α-solid solutions in Fe-Al alloys, revealed by the absence of random distribution of Fe and

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Al atoms in the lattice, and by the tendency to formation of blocks of ordered structure, Fe-Al alloys should be more creep-resistant than pure α-Fe and this conclusion has been confirmed by the results of the present investigation.
There are 4 figures and 14 references: 9 Soviet-bloc and 5 non-Soviet-bloc. The four latest English-language references mentioned are: Ref. 3 - Roser Chans - J. Appl. Phys., 1960, v.31, no. 3, 484; Ref. 6 - N.F. Mott - Nature, 1955, 175, 365; Ref. 7 - J. Weertman - J. Appl. Phys., 1955, v. 26, no. 10, 1213; Ref. 8 - O.D. Sherby, R.L. Orr, J.E. Dorn - J. Metals, 1954, 6, 71 - 79.

SUBMITTED: May 18, 1961

Card 6/6

BYSTROV, L.N.; IVANOV, L.I.

IMET-4K equipment for the investigation of creep of metals during torsion. Issl. po zharopr. splav. 7:286-288 '61. (MIRA 14:11)
(Creep of metals) (Testing machines)

37730

S/180/62/000/002/009/018
E040/E135

18.1235

AUTHORS: Ivanov, L.I., Matveyeva, M.P., Morozov, V.A., and Prokoshkin, D.A. (Moscow)

TITLE: On the self-diffusion of chromium

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo, no.2, 1962, 104-106

TEXT: In spite of the fact that chromium is widely used as an alloying element and that it serves as a basis of development of heat resistant alloys, its physico-chemical properties have not yet been fully investigated. Furthermore, such data as have been reported in technical literature are often very contradictory. For these reasons a re-examination was made of self-diffusion of chromium on specimens prepared from electrolytic chromium (99.96% pure) with nitrogen content of less than 0.010% and oxygen content of the order of 0.1%. The specimens were prepared by levitation melting and casting in copper moulds in an atmosphere of dry and purified helium. The specimens were in

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On the self-diffusion of chromium

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the form of rings 16 mm in diameter. After polishing, Cr^{51} was deposited on the specimen surface under a vacuum of 10^{-5} mm Hg. Care was taken to ensure an even thickness of the deposit of the radioactive chromium. Diffusion annealing was carried out at 1050-1400 °C in a special vacuum furnace in a corundum crucible, using simultaneously two specimens positioned face-to-face; the actual annealing temperature being controlled by means of two Pt/Pt-Rh thermocouples. The self-diffusion coefficient of chromium was determined by a method described previously by I.B. Borovskiy, Yu.G. Miller and A.P. Shcherbakov (Ref.8: Samodiffuziya v α-Fe. Issledovaniya po zharoprochnym splavam (Self-diffusion in α-Fe. Research in Heat Resistant Alloys). Izd-vo AN SSSR, 2, 1957, 208) and by L.I. Ivanov and N.P. Ivanichev (Ref.9: Izv. AN SSSR, OTN, no.8, 1958). A layer with a thickness of about 10 microns was removed at each stage, the thickness of the layer thus removed being controlled with an accuracy of ± 0.001 mm. The radioactivity determination was on filter paper moistened with a 15% NaCl solution using scintillation counters and reference standards. The test results

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On the self-diffusion of chromium S/180/62/000/002/009/018
E040/E135

are plotted as log I vs. x^2 curves (I = intensity of radiation and x = distance from the specimen surface). Coefficients of volume diffusion of chromium were calculated from the above curve and are reported for various temperatures. The temperature dependence of chromium self-diffusion was found to obey the following relation:

$$D = 0.0647 \exp\left(\frac{-59200}{RT}\right) \quad (1)$$

where R - universal gas constant and T - temperature. Investigation of the self-diffusion of chromium is also of great interest because chromium has a body-centred crystal lattice structure. If it is assumed that the vacancy mechanism of self-diffusion holds true for body-centred crystal lattice metals, it can be shown that

$$D_o = a^2 v \exp\left(\frac{\Delta S}{R}\right) \quad (3)$$

where: D_o - self-diffusion velocity; a - lattice constant; v - atom oscillation frequency; ΔS - entropy of self-diffusion activation; R - gas constant. The entropy calculated in the

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present investigation was positive although negative entropies of chromium self-diffusion activation were previously reported by other workers. However, it was also shown previously that ΔS cannot be negative for metals with cubic crystal lattice structure if the energy of activation of self-diffusion exceeds 10 kcal/g.atom and if the vacancy mechanism of self-diffusion is assumed to apply.
There are 3 figures and 2 tables.

SUBMITTED: July 17, 1961

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S/180/62/000/005/011/011
E193/E383

AUTHORS: Bystrov, L.N., Ivanov, L.I. and Prokoshkin, D.A. (Moscow)

TITLE: Creep of copper and copper-nickel alloys in torsion

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhnicheskikh nauk. Metallurgiya i toplivo, no. 5, 1962, 197 - 209

TEXT: The paper reports the results of an investigation on creep of copper and copper-nickel alloys with 0.5, 1.0, 10, 20 and 30% Ni. Cylindrical test pieces were machined from vacuum-melted, forged and then cold-rolled materials. Torsion creep tests were conducted at 450 - 1 100 °C under stresses ranging from 3.94×10^7 to 27.2×10^7 dynes/cm^2. Each test piece was given a 20-min anneal at 1 050 °C before the tests. The results obtained for copper are reproduced in Fig. 1, where $\log(\dot{\varepsilon}T\mu^{3.5})$ is plotted against $1/T.10^4$, curves 1-6 relating to tests conducted under stresses of 1 - 40 kg/cm^2, 2 - 65, 3 - 89, 4 - 133, 5 - 205, 6 - 276 ($\dot{\varepsilon}$ is the creep rate, deg/sec,

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Creep of copper ....

μ is the elastic modulus, dynes/cm^2 and T is temperature, ^oK). It will be seen that at rates of creep exceeding a certain critical value, $\dot{\varepsilon} \sim 10^{-3}$ deg/sec, the experimental points form straight lines, the slope of which is practically independent of the applied stress, giving the activation energy for creep of copper equal to 46.9 $\pm$ 3.3 kcal/mole, which is very near to the value of the activation energy for self-diffusion of copper. The stress dependence of the rate of creep was found to be $\dot{\varepsilon} \sim \sigma^{6.52}$. Below the critical value of $\dot{\varepsilon}$ the experimental points in Fig. 1 deviated from the linear relationship to an extent which increased with decreasing stress. Creep curves [deformation (ε, deg) versus time (t, min)] for copper specimens tested under a stress of 40 kg/cm^2 at 940 ^oC (graph a) and 870 ^oC (graph б) are reproduced in Fig. 3. It will be seen that, in this case, the rate of creep under conditions of constant temperature and stress does not remain constant but periodically increases in a step-like fashion. Metallographic examination of copper specimens at various stages of creep under various conditions showed that this effect was not associated with

grain-boundary slide. The departure of the $\log(\dot{\varepsilon}T\mu^{3.5})$ versus $1/T \times 10^4$ relationship from linear was also observed in the case of copper-nickel alloys containing less than 10% nickel; the effect was confined to test pieces tested under low stresses. A large part of the present paper is concerned with the physical meaning of the step-like change in the rate of creep mentioned above, which is associated with the departure of the $\log(\varepsilon T\mu^{3.5})$ versus $1/T \times 10^4$ relationship from linearity. The following explanation was postulated: the field of stress of dislocations piled up against th grain boundaries will increase with increasing deformation in proportion to the number of these dislocations. The field acts, on the one hand, on the Frank-Reed sources, reducing the number of dislocation loops generated and, on the other hand, exerts ever increasing pressure on the boundary dislocation walls. When this pressure exceeds a certain critical value, a void can be formed at the grain boundary, into which the dislocation pile-ups can be discharged. As a result, the field of stress suppressing the activity of the Frank-Reed sources disappears and the rate of creep sharply increases.

S/659/62/009/000/010/030
I003/I203

AUTHORS: Bystrov, L. N., Ivanov, L. I. and Surova, E. A.

TITLE: Investigation of creep in α-iron by a torsion method

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Issledovaniya po zharoprochnym splavam. v. 9. 1962. Materialy Nauchnoy sessii po zharoprochnym splavam (1961 g.), 72–81

TEXT: Ideas on the nature of the activation energy of creep and its dependence on stress and temperature are contradictory. The present investigation was conducted in a vacuum for a temperature range from 630° to 900°C. For stresses from 40 to 138 kg/cm² the activation energy of creep is practically independent of stress, and on the average is equal to 77.7 Ckal/g at.. Within the above limits of stress and temperature, the creep of the α-iron is believed to be due to dislocation movements, the activation energy of which is equal to the sum of the activation energies of self-diffusion and to the energy of formation of edge dislocations. When the applied stresses are increased up to 439 kg/cm², the energy of activation drops sharply to 50Kcal/g at. No relationship was found between the temperature and the energy of activation within the limits of stress investigated. A calculation was made of the distribution of torsional stresses throughout the section of the samples under conditions of creep. In the following discussion, A. Ya. Shinyaev reported on creep in nickel and nickel-base alloys, and Yu. P. Romashkin, suggested that the dependence of the energy of activation of creep on defor-

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mation and on previous treatment of the material should be taken into account, the authors of the article did not do this. M. L. Bernshtein pointed out that discrepancies between the results of this work and those of other Soviet authors. There are 3 figures.

SUROVA,, E.A. (Moskva); BYSTROV, L.N. (Moskva); IVANOV, L.I. (Moskva)

Connection between the elasticity modulus and the creep rate in iron-aluminum alloys at high temperatures. Izv. AN SSSR. Otd. tekh. nauk. Met. i gor. delo no.4:130-134 Jl-Ag '63. (MIRA 16:10)

ACC NR: AP6002571 SOURCE CODE: UR/0286/65/000/023/0061/0061

INVENTOR: Ivanov, L. I.; Antsev, V. G.

ORC: none

TITLE: Photoelectric rotational-velocity transducer /announced by the Leningrad electrotechnical institute on communication im. Professor M. A. Bonch-Bruyevich (Leningradskiy elektrotekhnicheskiy institut svyazi)/. Class 42, No. 176725

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 23, 1965, 61

TOPIC TAGS: transducer, velocity transducer, rotational velocity transducer, photocell, cathode ray tube, photoelectric transducer

ABSTRACT: An Author Certificate has been issued for a photoelectric rotational-velocity transfucer containing a light source, a light-beam modulator in the form of white and black traces painted on the end of the controlled shaft, and a photocell (see Fig. 1). To broaden the measurement range for increased rotational velocities,

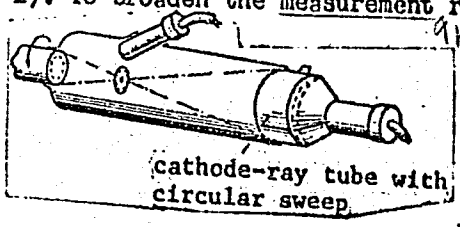
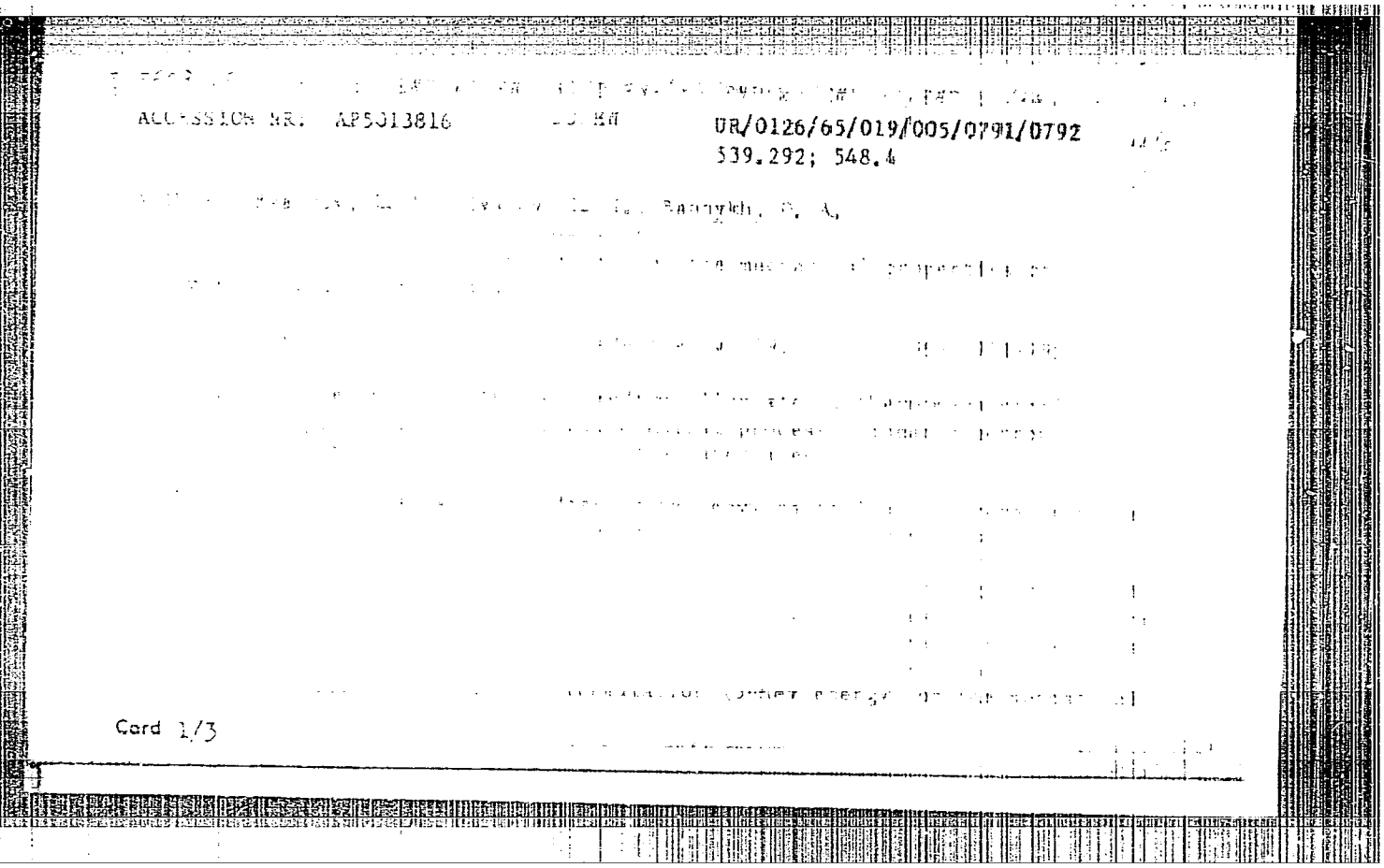


Fig. 1. Photoelectric rotational-velocity transducer

Card 1/2

UDC: 531.771.002.56:621.383.292

Card 2/2



ACCESSION NR: AP5013816 UR/0126/65/019/005/0791/0792
539.292; 548.4

Card 1/3

ACCESSION NR: AP5013816

Card 2/3

ACCESSION NR: AP5011816

1 figure, 1 table.

ASSOCIATION: Institut metallurgii im. A. A. Baykova (Institute

NO REF SOV: 002 OTHER: 001

Card 3/3

EPSHTEYN, Ye.I., inzh.; SMORODINOV, A.N., inzh.; BOCHAROV, D.I., inzh.; BOCHKAREV, G.N., inzh.; Prinimali uchastiye: MURAV'YEV, I.T.; MASLOV, V.I.; LOBANOV, I.I.; IVANOV, A.P.; IVANOV, L.I.

Start of converter substations with mercury-arc rectifiers without sorting and forming of the rectifiers. Prom. energ. 18 no.9:32-35 S '63. (MIRA 16:10)

L 42941-66 EWT(m)/EWP(w)/T/EWP(t)/ETI IJP(c) JD/WW/JJ

ACC NR: AP6029682 SOURCE CODE: UR/0369/66/002/004/0422/0425 61 B

AUTHOR: Abramyan, E. A.; Ivanov, L. I.; Kudryavtsev, N. S.; Yanushkevich, V. A.

ORG: Institute of Metallurgy im. A. A. Baykov, AN SSSR, Moscow (Institut metallurgii AN SSSR)

TITLE: Effect of vacuum on the creep of β-zirconium at high temperature

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 4, 1966, 422-425

TOPIC TAGS: zirconium, creep, vacuum ~~effect~~ technique, ~~zirconium~~ rupture ~~life~~ strength

ABSTRACT: The effect of vacuum (10^{-6} to 10^{-1} mm Hg) on the creep rate and rupture life of zirconium at 1100—1300C and under stresses of 5—30 kg/mm^2 has been investigated. In a vacuum of about 10^{-5} at 1200C, the creep rate was constant for more than 10 hr. The specimens did not fail and the material was very ductile. With the pressure in the vacuum chamber increased to 10^{-4} mm Hg, the creep rate was found to decrease continuously with time. Simultaneously with a drop of ductility, the rupture life decreases and the failure occurs in a very short time. The negative effect of higher pressure on rupture life and ductility becomes more intensive with increasing temperature and stress. Orig. art. has: 3 figures. [WW]

SUB CODE: 11/ SUBM DATE: 28Feb66/ ORIG REF: 005/ OTH REF: 005/ ATD PRESS: 5069

Card 1/1 MLP

ZAKHARKIN, L.I.; SOROKINA, L.P.; IVANOV, L.L.

Preparation of complex aluminum acetylides from complex aluminum amides and α-acetylenes. Izv. AN SSSR Ser. khim. no.1:180-182 '65. (MIRA 18:2)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

S/063/60/005/005/016/021
A051/A029

AUTHORS: Golovanenko, B.I., Sladkov, A.M., Ivanov, L.L., Kalashnikova, Z.S. Menyaylo, A.T.

TITLE: The Synthesis of Primary Fatty-Aromatic Alcohols Using Triisobutylaluminum

PERIODICAL: Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva im. D.I. Mendeleyeva, 1960, No. 5, Vol. 5, p. 594

TEXT: The possibility of realkylation of triisobutylaluminum, according to the reaction:

$$al - CH_2 - \underset{CH_3}{\overset{CH_3}{CH}} + CH_2 = CH - R \rightarrow al - CH_2 - CH_2 - R + CH_2 = \underset{CH_3}{\overset{CH_3}{C}}$$

where $al = \frac{1}{3} Al.$, based on a stipulation made by Ziegler (Ref. 2) was investigated by the authors. It is assumed that triisobutylaluminum will be-

Card 1/4

S/063/60/005/005/016/021
A051/A029

The Synthesis of Primary Fatty-Aromatic Alcohols Using Triisobutylaluminium

come an industrial product in the near future due to the comparative simplicity of production of the latter by the direct synthesis from isobutylene, aluminum and hydrogen and also due to its high catalytic activity in combination with titanium halides for the polymerization of unsaturated hydrocarbons (Ref. 3,4). The authors also determined the optimum conditions for the synthesis and the effect of certain additions on the yield of the specific products. Several experiments were carried out in order to determine the effect of finely-dispersed nickel on the realkylation reaction in view of the fact known from Ref. 5 that finely-dispersed nickel brings about the displacement reaction of less active alkyl groups in the form of olefines from the aluminum trialkyls by the more reactive olefines. The experimental procedure was as follows: the mixture of α-olefine and triisobutylaluminum was heated in a circular-bottom flask with a reversible cooler to 120-140°C. The isobutylene formed was collected in the gasometer. The reaction lasted 3-6 hours. After the formation of isobutylene stopped, the obtained product was acidified by air oxygen in the flask with a mixer at 40°C. After the acidification was completed the obtained product was subjected to hydro-

S/063/60/005/005/016/021
A051/A029

The Synthesis of Primary Fatty-Aromatic Alcohols Using Triisobutylaluminum

lysis with an aqueous solution of NaOH or HCl, then this was dried and distilled. In order to obtain finely-dispersed nickel, in some experiments, prior to the reaction nickel acetylacetonate was added to the mixture in quantities of 150 ml/mole of the olefine previously dissolved in dry octane. The alcohol yields were estimated from the initial triisobutylaluminum. The greatest yield was obtained from α-methylstyrene, somewhat less from vinyltoluene, vinylethylbenzene and styrene. The presence of nickel in the case of α-methylstyrene was found to increase the yield; in the case of styrene the yield dropped. The experimental results showed that there is a practical possibility of synthesizing primary alcohols by the simple method, without using increased pressure and special equipment. There is 1 table and 5 references: 1 Soviet, 3 German, 1 Rumanian.

Card 3/4

S/063/60/005/005/016/021
A051/A029

The Synthesis of Primary Fatty-Aromatic Alcohols Using Triisobutylaluminum

ASSOCIATION: Nauchno-issledovatel'skiy institut sinteticheskikh spirtov i organicheskikh produktov (Scientific Research Institute of Synthetic Alcohols and Organic Products)

SUBMITTED: April 29, 1960

Card 4/4

BOTVINIK, M.M.; OSTOSLAVSKAYA, V.I.; IVANOV, L.L.

Synthesis of esters of acylated amino acids and glycolic acid.
Zhur. ob. khim. 31 no.1:42-45 Ja '61. (MIRA 14:1)

1. Moskovskiy gosudarstvennyy universitet.
(Amino acids) (Glycolic acid)

82849

S/105/60/000/009/001/003
B019/B054

9,3220

AUTHOR: Ivanov, L. L., Engineer

TITLE: The Principles of the Analytical Theory of Discontinuous Functions and the Calculation of Nonlinear Electric Circuits

PERIODICAL: Elektrichestvo, 1960, No. 9, pp. 23-29

TEXT: In the introduction the author refers to the use of functions with discontinuous derivatives or interruption of continuities in the study of nonlinear circuits. In the present paper he suggests a method which is based on the use of a module function and of the "ant'ye" function. In the first two parts, he describes the elements of the theory and considers some examples which show the usefulness of the method and the necessity of its further development. The examples given here are thoroughly described in a paper by the author (Ref. p. 23) which was published in the periodical "Sbornik nauchnik Trudov MVTU". The author proceeds from functions (1), (2), and (3) (Figs. 1, 2, 3) which are a module function, an "ant'ye" function, and a discontinuous periodic function with the period 1. He deals with the analytical representation of the discontinuous functions shown in

Card 1/3

The Principles of the Analytical Theory of Discontinuous Functions and the Calculation of Nonlinear Electric Circuits

Figs. 4-8, and subsequently discusses 6 examples. The second part first refers to the convenience - resulting from the examples - of the use of the module function and of the "ant'ye" function in solving nonlinear problems. The method suggested automatically ensures the conjugation of the solutions in the points of discontinuity of the functions, and makes it possible to represent various n-dimensional geometrical loci by an equation, where the character of the variation of the variable can be taken into account at the same time. Fig. 17 is briefly referred to as an example. There, the area limited by $ae^x - y \geqslant 0$ and $y - bx^2 \geqslant 0$ is marked by a broken line; the author derives an expression by the above method which indicates the coordinates for all points in this area marked by the broken line. Equation (21) is obtained as a solution which holds for $ae^x - bx^2 \geqslant 0$; otherwise, (20) loses its sense. By extension of the numerical concept the theory of analytical functions attains a more general meaning by using the algebra of hypercomplex numbers as a basis. Thus, it is possible to avoid certain shortcomings in the theory of discontinuous functions, which is explicitly demonstrated. There are 20 figures and 1 Soviet reference.

4

828419

The Principles of the Analytical Theory of Discontinuous Functions and the Calculation of Nonlinear Electric Circuits

S/105/60/000/009/001/003
B019/B054

ASSOCIATION: Moskovskoye vyssheye tekhnicheskoye uchilishche im. Baumana (Moscow Higher Technical School imeni Bauman)

SUBMITTED: May 9, 1960

Card 3/3

ZAKHARKIN, L.I.; GAVRILENKO, V.V.; IVANOV, I.L.

Preparation of complex aluminum acetylides of the type $MAlR'_{(4-n)}(C{\equiv}CR)_n$ and their solvates. Zhur. ob. khim. 35 no.9:1676-1680 S '65. (MIRA 18:10)

ZAKHARKIN, L.I.; IVANOV, L.L.

Action of alkali metals and their hydrides on triphenylaluminum. Izv.AN SSSR. Ser.khim. no.1:196-197 Ja '64. (MIRA 17:4)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

9,3220

S/196/61/000/006/001/014
E032/E414

AUTHOR: Ivanov, L.L.

TITLE: Fundamentals of the analytical theory of discontinuous functions and design of nonlinear electrical circuits

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, 1961, No.6, p.8, abstract 6 A46 . (Sb. Vses. Mezhvuz. konferentsiya po teorii i metodam rashceta nelineyn. elektr. tsepey (Collection of papers of the All-Union Inter-collegiate Conference on the Theory and Design of nonlinear electrical circuits) No.2-1, Tashkent, 1960, 1-16)

TEXT: The author compares solutions obtained for nonlinear systems with discontinuous functions and derivatives. A special commutative and associative algebra of hypercomplex numbers is set up. The theory of ordinary analytical functions is a special case of this algebra. There is 1 reference.
Abstracted by N.Gol'tsov.
[Abstractor's Note: Complete translation.]

Card 1/1

ACCESSION NR: AP5006420 S/0062/65/000/001/0180/0182

AUTHOR: Zakharkin, L. I.; Sorokina, L. P.; Ivanov, L. L.

TITLE: Obtaining complex aluminum acetylenides from complex aluminum amides and α-acetylenes

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 1, 1965, 180-182

TOPIC TAGS: aluminum, aluminum compound, acetylene, complex molecule

ABSTRACT: Complex aluminum acetylenides can be obtained from the interaction of complex aluminum amides with α-acetylenes. The following were [illegible] tetra(dimeth[illegible]

[illegible]. Orig. art. has: 5 equations.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elementoorganic Compounds, Academy of Sciences SSSR)

Card 1/2

GAVRILENKO, V.V.; IVANOV, L.L.; ZAKHARKIN, L.I.

Reactions complex aluminum acetylides with carbonyl compounds. Zhur. ob. khim. 35 no.4:635-638 Ap '65.

(MIRA 18:5)

ZAKHARKIN, L.I.; GAVRILENKO, V.V.; IVANOV, L.L.

Preparation of acetylenecarboxylic acids by the action of carbon dioxide on complex aluminum acetylides. Izv. AN SSSR Ser. khim. no.11:2066-2068 N '64 (MIRA 18:1)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

IVANOV, L.L.; GAVRILENKO, V.V.; ZAKHARKIN, L.I.

Reaction of monosubstituted acetylenes with lithium, potassium, and sodium aluminum hydrides and their alkyl derivatives of $MALR_{(4-n)}H_n$ type. Izv. AN SSSR Ser. khim. no.11:1989-1998 N '64 (MIRA 18:1)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

IVANOV, L. M.

Research on the etiology of kidney diseases in the Vrattsa District. Suvrem. med., Sofia 7 no.9:30-34 1956.

1. Iz Okruzhnata sanepidstantsiia - Vratsa.
(KIDNEY DISEASES, etiol. and pathogen.)

5(2); 21(5) PHASE I BOOK EXPLOITATION SOV/1900

Akademiya nauk SSSR. Komissiya po analiticheskoy khimii

Primeneniye radioaktivnykh izotopov v analiticheskoy khimii (Use of Radioactive Isotopes in Analytical Chemistry) Moscow Izd-vo An SSSR, 1958. 366 p. [Series: Its: Trudy, t. 9 (12)] Errata slip inserted. 3,000 copies printed.

Resp. Ed.: I.P. Alimarin, Corresponding Member, USSR Academy of Sciences; Ed. of Publishing House: A.N. Yermakov; Tech. Ed.: T.V. Polyakova.

PURPOSE: The book is intended for chemists and chemical engineers concerned with work in analytical chemistry.

COVERAGE: The book is a collection of the principal papers presented in Moscow at the Second Conference on the Use of Radioactive Isotopes. The problems discussed at the Conference included coprecipitation, aging, and solubility of precipitates, determination of the instability constants

Card 1/10

of complex compounds, separation of rare earth metals, and ion-exchange chromatography. No personalities are mentioned. There are 351 references, 175 of which are Soviet, 33 German, 19 French, 8 Swedish, 2 Hungarian, and 2 Czech.

TABLE OF CONTENTS:

Name: IVANOV, Leonid Mikhaylovich

Dissertation: The revolution of 1905-1907 in the Ukraine

Degree: Doc Historical Sci

Affiliation: [Not indicated]

Defense Date, Place: 23 Apr 56, Council of Inst of History, Acad Sci USSR

Certification Date: 9 Mar 57

Source: BMVO 13/57

1. IVANOV, L.M.

2. USSR (600)

4. Cranes, Derricks, Etc.

7. Increasing the operating stability of electric motors of cranes, Eng., Rab.energ. 3, no. 4, 1953.

9. Monthly List of Russian Accessions, Library of Congress, APRIL 1953, Uncl.

IVANOV, L.M.

AID P - 1392

Subject : USSR/Electricity

Card 1/1 Pub. 26 - 19/30

Authors : Ivanov, L. M., Karmazin, I. A., Freyman, Yu. A., Engs.

Title : Rebuilding of the UK-type speed governor of a medium capacity water-wheel

Periodical : Elek. Sta., 2, 52-54, F 1955

Abstract : The described speed governor built by the Leningrad Metal Works im. Stalin is installed at a fully automatic hydropower station with remote control. The article describes the reconstruction details and the step-by-step functioning of the governor after its reconstruction. 2 drawings.

Institution: None

Submitted : No date

IVANOV, L.M.

AID P - 2351

Subject : USSR/Electricity

Card 1/1 Pub. 27 - 15/30

Authors : Ivanov, L. M., and Freyman, Yu. A., Engs.

Title : An experiment in automatic synchronization of generators at a hydroelectric power station

Periodical : Elektrichestvo, 5, 61-62, My 1955

Abstract : The authors describe details of the performance of two vertical 17,500-kva, 10.5-kv, 150-rpm, water-wheel electric generators under automatic synchronization. This method was introduced in 1951 and operated so satisfactorily, that the arrangement for field-adjusted synchronization was dismounted in 1954. During 4 years of operation the generators were subjected 3400 times to automatic synchronization with very few cases of failure.

Institution: None

Submitted : N 26, 1954

IVANOV, L.M.

Metal coating bridges. Put.i put.khoz. no.4:21-22 Ap '57.
(MLRA 10:5)

1.Nachal'nik otdela inzhenernykh sooruzheniy slushby puti Moskovsko-Okruzhnoy dorogi.
(Railroad bridges)

Chief, Div. of Engineering Construction of track maintenance of Moscow circuit railway.

IVANOV, L.N., kand. tekhn. nauk, starshiy prepodavatel';
ISAYEV, A.N., aspirant

Increasing the coefficient of the useful time of warping machines. Tekst. prom. 22 no.7:72-76 Jl '62.
(MIRA 17:1)

1. Kafedra teorii mekhanizmov priborov i mashin Moskovskogo tekstil'nogo instituta.

SERYY, Yu.I., kand. ist. nauk, otv. red.; IVANOV, L.M., doktor ist. nauk, red.; KIR'YANOV, Yu.I., kand. ist. nauk, red.; KUZNETSOV, V.I., kand. ist. nauk, red.; KHLYSTOV, I.P., kand. ist. nauk, red.

[Papers at the October 1963 academic session in Rostov-On-Don devoted to the history of the working class in Russia during the period of capitalism] Doklady na nauchnoi sessii, posviashchennoi istorii rabochego klassa Rossii v period kapitalizma Rostov-na-Donu, 1963 g. Rostov-na-Donu, AN SSSR, 1963. 106 p. (MIRA 17:5)

1. Nauchnaya sessiya, posvyashchennaya istorii rabochego klassa Rossii v period kapitalizma, Rostov-on-Don, 1963. 2. Institut istorii AN SSSR (for Ivanov). 3. Rostovskiy gosudarstvennyy universitet (for Seryy).

ACC NR: AM6024523 Monograph UR/

Domaratskiy, A. N.; Ivanov, L. N.; Karyshev, YE. N.; Sinitsyn, B. S.

Discrete measurement correlation systems; (DIKS) (Diskretnaya izmeritel'naya korrelyatsionnaya sistema; DIKS) Novosibirsk, Izd-vo "Nauka," 1965. 107 p. illus., biblio. (At head of title: Akademiya nauk SSSR. Sibirskoye otdeleniye) Errata slip inserted. 2050 copies printed.

TOPIC TAGS: discrete measurement correlation system, ~~stationary~~ ergodic process, ~~correlation~~ ~~ergodic random function~~, ~~discrete measuring system correlation function~~, function theory, random process, logic circuit, computer component

PURPOSE AND COVERAGE: This book is intended for readers engaged in work with measurement systems. The discrete measurement correlation system (DIKS) developed at the Institute of Automation and Electrometry of the Siberian Department of the Academy of Sciences USSR, Novosibirsk is described. Problems connected with the design and development of the DIKS are covered fully. Some individual units of this system, especially the design of their inputs, may be of interest to computer engineers.

TABLE OF CONTENTS:

Card 1/3

ACC NR: AM6024523

Card 2/3

ACC NR: AM6024523

SUB CODE: 09,12/ SUBM DATE: 07Jun65/ ORIG REF: 045/ OTH REF: 005

Card 3/3

L 46291-65

ACCESSION NR: AT5009092 S/0000/64/001/000/0161/0165

AUTHOR: Vorontsov, V. P. (Novosibirsk); Domaratskiy, A. N. (Novosibirsk); Ivanov, L. N. (Novosibirsk)

TITLE: On the choice of memory units for digital correlators

SOURCE: Konferentsiya po avtomaticheskomu kontrolyu i metodam elektricheskikh izmereniy. 2d, Novosibirsk, 1961. Avtomaticheskiy kontrol' i metody elektricheskikh izmereniy; trudy konferentsii, t. 1: Metody elektricheskikh izmereniy. Analiz i

SOURCE: Konferentsiya po avtomaticheskomu kontrolyu i metodam elektricheskikh izmereniy. 3d, Novosibirsk, 1961. Avtomaticheskiy kontrol' i metody elektricheskikh izmereniy; trudy konferentsii, t. 1: Metody elektricheskikh izmereniy. Analiz i sintez sistem upravleniya i kontrolya. Elementy ustroystv avtomaticheskogo kontrolya (Automatic control and electrical measuring techniques; transactions of the conference, v. 1: Electrical measuring techniques. Analysis and synthesis of regulation and control systems. Elements of automatic control devices). Novosibirsk, Redizd. Sib. otd. AN SSSR, 1964, 161-165

TOPIC TAGS: digital correlator, memory unit, tape memory, drum memory, magnetic memory

ABSTRACT: It is shown first that a simple and inexpensive memory unit of adequate capacity is an essential part of a digital correlator used to process data recorded on paper charts or films, since the nature of the data processing is such that fre-

capacity is an essential part of a digital computer used to process data received on punched cards or paper charts or films, since the nature of the data processing is such that fre-

Card 1/2

L 46291-65

ACCESSION NR: AT5009052

quent referral to the original information is not advisable. The choice is thus restricted to magnetic film or magnetic drums. The methods used to record the information on magnetic tape, the block diagram for re-recording numbers, and the block diagram of the entire memory unit are given. It is shown that such a memory makes

DOC: 4 figures.

ASSOCIATION: None

SUBMITTED: 13Apr64 ENCL: 00 SUB CODE: DP, IE

NR REF SOV: 001 OTHER: 002

Card 2/2

Karyshev, Ye. N.

TITLE: Specialized computer for statistical investigations

SOURCE: AN SSSR. Sibirskoye otdeleniye. Institut avtomatiki i elektrometrii. Trudy, no. 9, 1964. Elektricheskiye metody avtomaticheskogo kontrolya (Electric methods of automatic control), 94-102

TOPIC TAGS: statistical dynamics, digital computer, computer input device, computer memory, computer output device, magnetic drum storage, magnetic tape storage

[illegible] statistical investigations is proposed. The

netic drum (17 tracks, each with a capacity of 1024 bits) or magnetic tape.

Card 1/2

L 39916-65

ACCESSION NR: AT5003157

magnetic-tape unit can also serve as a delay unit to form the time shift required for calculating correlation functions. The processing unit consists of an accumulator, and a shift register or multiplier. The longest time it takes to add two [illegible] operating frequency is 47.7 kc; delay line in the accumulator is

for calculating correlation functions. The processing unit consists of an accumulator, and a shift register or multiplier. The longest time it takes to add two codes is 17 usec; operating frequency is 47.7 kc; delay line in the accumulator is 1 usec; the multiplier operates on triggers with no delay line. In the output unit, results are printed in the form of three-digit ten-figure columns after conversion to the decimal system. The readout unit, still in the development stage, utilizes [illegible] figures.

Card 2/2

DOMARETSKIY, A.N.; IVANOV, L.N.; KARYSHEV, Ye.N.; SINITSYN, B.S.; SHALINA, L.V., red.

[Discrete measuring correlation system (DIKS)] Diskretnaia izmeritel'naia korreliatsionnaia sistema (DIKS). Novosibirsk, Nauka, 1965. 107 p. (MIRA 19:1)

L 41162-66 EWT(d)/EWP(k)/EWP(h)/EWP(v)/EWP(l) IJP

ACC NR: AP6015381 (N) SOURCE CODE: UR/0410/65/000/004/0022/0027

AUTHOR: Ivanov, L. N. (Novosibirsk)

41 B

ORG: none

TITLE: Some aspects of the use of statistical test systems for the solution of the function optimization problem for several variables under conditions of random interference

SOURCE: Avtometriya, no. 4, 1965, 22-27

TOPIC TAGS: optimal automatic control, random process, data processing system, control statistics

ABSTRACT: The author investigates the application of one variety of a statistically-based data test system, designed for the automatic optimization and processing of primary information in the presence of interference sufficient to cause random test errors. The problem involves a controlled plant, having an optimum working characteristic segment and acted upon by control effects (input quantities) $x_1, x_2, \ldots x_n$, and interfering effects z which are reflected in changes in plant characteristics. In addition, random interference is present at the plant output. The output quantity y is related to the input quantities by the expression $y = f(x_1, x_2, \ldots, x_n)$ and is a random quantity. It is required to find, through automatic search, and to

Card 1/2 UDC: 62-505

L 23162-66

ACC NR: AP6015381

maintain the input quantities x_i ($i = 1, 2, \ldots, n$) such that function $y(i)$ will satisfy specific conditions,(e.g., an optimality requirement). It is assumed that y can be tested at the plant output, for which purpose a test computer has been incorporated into the system. A block diagram of a system for the optimization of function y with several variables is given, consisting of a "statistical test solving system," activator, and control unit. The efficiency of the automatic search process is discussed and certain recommendations on the search method to be used are presented. If in optimizing a function having several variables the measurement of the output quantity is subject to error, it is advisable that such a system employ a problem-solving test arrangement which on the basis of the theory of statistical solutions will ensure an optimal solution strategy. Through the measurement of on-going probability factor values, an optimization system with an efficient search routine can be developed. Orig. art. has: 3 figures and 13 formulas.

SUB CODE: 05,13/ SUBM DATE: 23Feb65/ ORIG REF: 005/ OTH REF: 001

Card 2/2 hs

IVANOV, L.N.

Small size searcher for checking electric circuits. [Suggested by L.N.Ivanov] Rats. i izobr. predl. v stroi. no.145:11-12 '56. (MLRA 10:3)

(Electric apparatus and appliances)

IVANOV, L.N., inzh.

Metal timbering and the transportation of wooden mine timbers.
Trudy TSNII MPS no.162:83-94 '58. (MIRA 12:4)
(Mine timbering--Transportation)

IVANOV, L.N., insh.

Improving the transportation of railroad ties. Trudy TSNII MPS no.162:95-108 '58. (MIRA 12:4)
(Railroads--Ties--Transportation)

IVANOV, L.N., inzh.

Methods for the graphic analysis of freight movements.
Vest. TSNII MPS 18 no.7:43-46 N '59. (MIRA 13:2)
(Railroads--Freight)

VERIGO, V.F., prof., doktor tekhn.nauk; IVANOV, L.N., inzh.

Adequate distribution of plants manufacturing reinforced concrete ties. Zhel.dor.transp. 42 no.8:52-54 Ag '60. (MIRA 13:8)
(Railroads--Ties, Concrete)

BARKOV, N.N., kand.ekonom.nauk; IVANOV, L.N., inzh.

Determining the economic efficiency of capital investments in railroad transportation. Zhel.dor.transp. 45 no.8:55-59 Ag '63. (MIRA 16:9)

(Railroads--Finance)

BARKOV, N.N., kand. ekon. nauk; Prinimali uchastiye: PONOMAREV, S.A., inzh.; YELISEYEVA, T.V., inzh.; MOLYARCHUK, G.V., kand. ekon. nauk; IVANOV, L.N., inzh.; KASHCHEYEVA, I.N., inzh.; LEGORNEVA, V.I., inzh.; KUZ'MINA, T.T., inzh; INOZEMTSEVA, K.N., inzh.; YANDOLOVSKIY, N.A., inzh.; PAVLOVA, Ye.A., starshiy tekhnik; VOLKOVA, L.S., starshiy inzh.; GAZAR'YAN, G.S., tekhnik; VOROB'YEVA, L.V., tekhn. red.

[Seasonal and weekday variations in railroad freight transportation]. Sezonnaia i vnutrinedel'naia neravnomernost' gruzovykh perevozok na zheleznykh dorogakh. Moskva, Transzheldorizdat, 1963. 95 p. (Moscow. Vsesoiuznyi nauchno-issledovatel'skii institut zheleznodorozhnogo transporta. Trudy, no. 249).

(MIRA 16:4)

(Railroads—Freight)

IVANOV, L.N., kand.tekhn.nauk

Calculating the press joint of the tenon and wringing shaft of sizing machines. Nauch.-issl.trudy VNIILTEKMASHa no.11:47-59 '54.

Investigating the performance of the picking mechanism of the STD loom during shuttle starting. Ibid.:59-72 (MIRA 18:6)

IVANOV, L.N., inzh.

Limiting the "time of amortization" by the "time of service." Vest. TSNII MPS 24 no.3:62-64 '65. (MIRA 18:8)

IVANOV, L.P.

Adjusting tuning-fork generators used at seismic stations.
Razved.i prom.geofiz. no.10:37-38 '54. (MIRA 13:2)
(Tuning forks)

IVANOV, L.P.

Complex system of automatic control of power plant on the steamer "Kolkhoznik." Inform. sbor. TSNIIMF no.64. Tekh. ekspl. mor. flota no.9:32-43 '61. (MIRA 16:6)
(Boilers, Marine) (Automatic control)

IVANOV, L.P.

Regulating the temperature of steam by means of an air cooler outside of the boiler. Inform. sbor. TSNIIMF no.94 Tekh. ekspl. mor.flota no.21:81-83 '63. (MIRA 17:4)

ACC NR: AP7002981 (N) SOURCE CODE: UR/0413/66/000/024/0079/0079

INVENTOR: Ivanov, L. P.

ORG: None

TITLE: A viscosity regulator for heavy fuels. Class 42, No. 189603

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 24, 1966, 79

TOPIC TAGS: viscosimeter, fluid viscosity, fuel control, FUEL PROPERTY

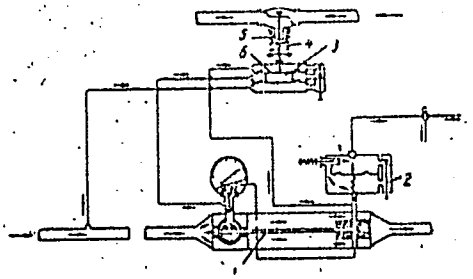
ABSTRACT: This Author's Certificate introduces: 1. A viscosity regulator for heavy fuels. The unit contains a capillary type viscometer mounted in the pipeline. A regulator is used for maintaining a constant fuel flow through the capillary tube. The installation also contains an amplification device (e. g. a diaphragm unit) which senses a pressure drop in the capillary tube and controls a vapor regulating valve mounted in the vapor heating line preceding the fuel heater. Design is simplified and reliability is improved by making the vapor regulating valve in the form of a rod and bellows located in a single housing. The rod is connected directly to the amplification device and the bellows senses vapor pressure behind the valve for compensating the force acting on the rod. 2. A modification of this regulator designed for complete elimination of variations and improvement of the dynamic control properties. An additional diaphragm is mounted in the amplification device which acts on

UDC: 662.753-404.2-533

Card 1/2

ACC NR: AP7002981

the valve rod when surges in fuel flow are detected.



1--viscometer; 2--flow regulator; 3--amplification device; 4--rod; 5--bellows; 6--additional diaphragm

SUB CODE: 21, 13, 20/ SUBM DATE: 03Apr64

Card 2/2

L 8493-66 EWT(m)/EWP(j)/T RM

ACC NR: AP5026476 SOURCE CODE: UR/0195/65/006/005/0889/0896

AUTHOR: Yermakov, Yu. I.; Ivanov, L. P.

ORG: Physiochemical Institute im. L. Ya. Karpov (Fiziko-khimicheskiy institut); Institute of Catalysis, SO AN SSSR (Institut kataliza SO AN SSSR)

TITLE: Study of the polymerization kinetics of ethylene on a chromium trioxide catalyst under conditions of formation of a crystalline polymer

SOURCE: Kinetika i kataliz, v. 6, no. 5, 1965, 889-896

TOPIC TAGS: chromium oxide, polymerization kinetics, ethylene

ABSTRACT: The study deals with the polymerization kinetics of ethylene on a chromium trioxide catalyst in cyclohexane attemperatures below 90C, i.e., in a suspension. The dependence of the polymerization rate on time is characterized by a distinct induction period in the course of which the polymerization rate changes from zero to a stationary value. After a period of constant polymerization rate, the latter decreases. The polymerization does not occur at a catalyst concentration below a certain threshold value, and varies as almost the square of the ethylene concentration. The existence of a

UDC 541.124:542.952.6:547.313.2

Card 1/2